

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claims 1-14, 16-20 and 23-24 have been amended.

1. (Currently amended) A three-dimensional image grabber, comprising:
a pattern projecting assembly for simultaneously projecting at least two phase-shifted patterns onto an object; each of said projected patterns ~~being characterized by a given range of wavelengths~~ being produced by decomposition of one of:
a white light, and
a non-white light including a plurality of monochromatic lights, into one of:
a plurality of monochromatic lights, and
non overlapping bandwidths ~~characterized by a predetermined bandwidth;~~ and
an image acquisition apparatus sensitive to said one of:
said plurality of monochromatic lights, and
said non-overlapping bandwidths for simultaneously taking an image of each of said projected patterns on the object.
2. (Currently amended) A The three-dimensional image grabber as recited in claim 1, wherein at least one of said at least two phase-shifted patterns ~~predetermined bandwidth includes a single wavelength~~ is monochromatic.
3. (Currently amended) A The three-dimensional image grabber as recited in claim 1, wherein said pattern projection assembly includes a semi-transparent plate including a pattern to be illuminated by an illuminating assembly, a spectral splitter to be positioned between said semi-transparent plate and said illuminating assembly and a projector for projecting said

semi-transparent ~~illuminated~~ plate onto said object; said illuminating assembly including a source of white light so positioned as to be projected through said semi-transparent plate.

4. (Currently amended) A The three-dimensional image grabber as recited in claim 3, wherein said illuminating assembly further includes an optical fiber and a condenser for bringing light from said white source to said semi-transparent plate.
5. (Currently amended) A The three-dimensional image grabber as recited in claim 3, wherein said semi-transparent plate is a grid.
6. (Currently amended) A The three-dimensional image grabber as recited in claim 1, wherein said pattern projection assembly includes at least two pattern projecting apparatuses and a reflecting arrangement; each of said pattern projecting apparatus being configured to project a light having a predetermined bandwidth—through a pattern; said reflecting arrangement being so configured as to direct said projected patterns along a common direction of incidence.
7. (Currently amended) A The three-dimensional image grabber as recited in claim 6, wherein at least one of said pattern projecting apparatuses includes a semi-transparent plate including a pattern to be illuminated by an illuminating assembly and a projector for projecting said ~~illuminated~~ plate onto said reflecting arrangement; said illuminating assembly including a source of light having a predetermined bandwidth and being so positioned as to be projected through said plate.
8. (Currently amended) A The three-dimensional image grabber as recited in claim 6, wherein said projecting arrangement includes at least one of a mirror and a semi-transparent mirror.
9. (Currently amended) A The three-dimensional image grabber as recited in claim 7 6, wherein said plate is a grid.

10. (Currently amended) A The three-dimensional image grabber as recited in claim 7 6, wherein said pattern projecting apparatuses are so positioned relative to each other as to each provide ~~the~~ a same distance from said ~~respective~~ plate to the object.
11. (Currently amended) A The three-dimensional image grabber as recited in claim 1, wherein said image acquisition apparatus includes at least one camera sensitive to one of:
said plurality of monochromatic lights, and
said non-overlapping bandwidths ~~said ranges of wavelengths~~.
12. (Currently amended) A The three-dimensional image grabber as recited in claim 11, wherein said image acquisition apparatus includes a telecentric lens.
13. (Currently amended) A The three-dimensional image grabber as recited in claim 1, wherein said image acquisition apparatus includes at least two cameras, each sensitive to ~~one of said:~~ ~~predetermined bandwidth~~ one of:
said plurality of monochromatic lights, and
said non overlapping bandwidths.
14. (Currently amended) A The three-dimensional image grabber as recited in claim 11, wherein said camera is selected from the group consisting of a Charge Coupled Device (CCD) camera and a Complementary Metal-Oxide-Silicon (CMOS) device.
15. (Original) A system for measuring the relief of an object, said system comprising:
a pattern projecting assembly for simultaneously projecting at least three phase-shifted patterns onto the object; each of said projected patterns being characterized by a predetermined bandwidth;
an image acquisition apparatus sensitive to said predetermined bandwidths for taking an image of each of said at least three phase-shifted projected patterns on the object; each of said images including a plurality of pixels having intensity values; and
a controller configured for:

- a) receiving from the image acquisition apparatus said at least three images of the projected patterns onto the object;
- b) computing the object phase for each pixel using the at least three object intensity values for the corresponding pixel; and
- c) computing the relief of the object at each pixel position using said object phase at the corresponding pixel position.

16. (Currently amended) A The system as recited in claim 15, wherein said pattern projecting assembly includes a grid illuminated by an illuminating assembly, a spectral splitter to be positioned between said grid and said illuminating assembly and a projector for projecting said illuminated grid onto said object; said illuminating assembly including a source of white light so positioned as to be projected through said grid.

17. (Currently amended) A The system as recited in claim 15, wherein said pattern projection assembly includes at least two pattern projecting apparatuses and a reflecting arrangement; each of said pattern projecting apparatus being configured to project a light having a predetermined bandwidth through a pattern; said reflecting arrangement being so configured as to direct said projected patterns along a common direction of incidence.

18. (Currently amended) A The system as recited in claim 15, wherein said image acquisition apparatus includes at least one camera sensitive to said predetermined bandwidths.

19. (Currently amended) A The system as recited in claim 15, wherein said computer includes memory means for storing said images during their process.

20. (Currently amended) A The system as recited in claim 15, wherein said computer includes at least one of a storing device, an input device and an output device.

21. (Original) The use of the system of claim 15, for lead-coplanarity inspection.

22. (Original) A method for measuring the relief of an object comprising:

- a) simultaneously projecting at least three phase-shifted patterns onto the object;
- b) taking an image of each of said at least three phase shifted patterns on the object to gather an intensity value at pixel positions on said image;
- c) computing the object phase for each of said pixel positions using the at least three object intensity values for the corresponding pixel; and
- d) computing the relief of the object at each pixel position using said object phase at the corresponding pixel position.

23. (Currently amended) A The method as recited in claim 22, wherein said at least three images are taken simultaneously.

24. (Currently amended) A three-dimensional image grabber, comprising:

a means for simultaneously projecting at least two phase-shifted patterns onto the object; each of said projected patterns ~~being characterized by a given range of wavelengths~~ being produced by decomposition of one of:

a white light; and

a non-white light including a plurality of monochromatic lights;

into one of:

a plurality of monochromatic lights, and

non overlapping bandwidths; and

a means for simultaneously taking an image of each of said projected patterns on the object; said image taking means being sensitive to ~~predetermined bandwidth~~ one of:

said plurality of monochromatic lights, and

said non overlapping bandwidths.